
Young Children's Digital Literacy Practices in the Home

A Review of the Literature



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<http://digilitey.eu>

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Abstract

This paper reports a review of research literature on young children's (aged 0-8 years old) digital literacy practices in the home. The review contributes to one of the aims of the COST DigiLitEY programme by identifying the current state of knowledge on young children's digital literacy and multimodal practices in homes and communities, including synthesising research on parental support of children's digital literacy development" (WG1 Mission Statement). Accordingly, the purpose of this review is to 1) summarise current research knowledge in the area of young children's digital literacy practices in the home, 2) identify key messages for educational researchers, parents and policy makers, and 3) propose key research questions in the field for future study. A total of 33 studies published between 2005 and 2015 were selected for the review. Informed by a descriptive and narrative approach, the review revealed three leading themes that emerged from the analysis, namely; Parental mediation of children's digital literacy practices in homes, Children's media engagement and literacy learning in homes, and home-school knowledge exchange of children's digital literacy practices. The major findings of these themes are highlighted and the review ends with key messages for parents; educational policy and practice, and educational researchers.

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Introduction

Working Group 1, WG1 of the COST DigiLitEY programme is concerned with the digital literacy and multimodal practices of young children in homes and communities. The aim of this working group is to “identify the current state of knowledge on young children’s digital literacy and multimodal practices in homes and communities, including synthesising research on parental support of children’s digital literacy development.”¹

An obvious audience to whom this review is addressed is those educational researchers and informed parents concerned with children’s digital literacy practices in homes, perceiving, with Livingstone and Das, (2010: 3) “the family as a vital driver of social change.” However, we argue that research in this area is also pertinent to educators and educationalists. Over a decade has passed since Knobel, after discussing recognition of the role schools play in children’s literacy development, observed:

What has been less attended to, but is rapidly gaining ground as a recognised field of research focus, is the literacies young children aged birth to eight years actually *are practising* in their prior-to-formal schooling and out-of-school lives and which in many ways can be more sophisticated and ‘mature’ than those prescribed for them as ‘developmentally appropriate’ in formal school or school-like settings.

(Knobel, 2006: 11, original emphasis)

From our professional experiences as researchers ourselves of young children in- and out-of-school, we believe Knobel’s opinion may still hold a great deal of truth and so consider a current investigation of others’ research worthwhile.

¹ (WG1 Mission Statement online at <http://digilitey.eu/working-groups/wg1-digital-literacy-in-homes-and-communities/>)

Aims, Scope and Conceptual Framework

Conducting a literature review involves making decisions about aims and scope. We decided for this review to focus on the digital literacy practices of young children (0-8) in the home. Our aim is to identify recent scholarly literature on this topic, to ascertain purposes for investigation, findings, and disciplinary sources and to synthesise these and reflect upon them. We needed first to decide upon our scope.

Were we to extend the research beyond the home and employ an understanding of “communities” (as contained in the title of our working group) we would blur the boundaries of settings studied and, an additional consideration, infringe the territory of other working groups in a way that might not be helpful. We recognise that homes are situated in communities and it seems to us most sensible and workable to remain cognisant of this in our readings of studies rather than to include research outside home settings. Therefore we decided to identify and explore empirical studies of young children’s digital literacy practices in home settings.

Every literature review has assumptions which underlie decisions such as terms to include, sources to explore and so on. Vital for us is a starting point that explicitly addresses the question of “What is meant by literacy” recognising that there are many different ways of conceptualising literacy, activities centred on reading and/or writing and that we are located in a particular paradigm called Literacy Studies (or sometimes New Literacy Studies). The most complete recent outlines of the territory of Literacy Studies is the collection edited by Rowsell and Pahl, (2015) and another which focuses more on children and education edited by Hall, Cremin, Comber, and Moll, (2013b). These volumes are united by a broadly sociocultural orientation, that entails a recognition of literacy practices as always situated in time and place and a committed interest in furthering positive change

in the face of inequalities (Hall, Cremin, Comber, and Moll, 2013a: xxxviii; Rowsell and Pahl, 2015a: 3).

In our review, we are particularly interested in studies that address literacy within the context of children's use of digital technologies and media, that we call digital literacy practices. An important point to recognise is that studies involving children's digital literacy practices in the home sometimes prefer to locate themselves as concerning "media" rather than "literacy". To search for studies that self-identify as "literacy" studies would again, possibly, create an unnecessary demarcation of studies that do not identify as such, but which are very much concerned with issues such as parental influence on children's media use, skills and learning.



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Methods

This review of research is informed by a descriptive and narrative approach (Dixon-Woods et al., 2006; Kavanagh, Campbell, Harden, and Thoms, 2012). A descriptive and narrative approach allows a more comprehensive synthesis of different research designs and methodologies, without privileging any method over the other. Second, a descriptive and narrative approach was considered appropriate to serve the goals of this review allowing us to capture the current state of knowledge, and extract key messages for educational researchers, parents and policy makers, and propose research questions and recommendation in the field for future study.

We are also committed to reflecting on social justice in our methodology. Influenced by current perspectives that may be characterised as relative materialism, we sought to think freshly about the purposes of a literature review, rejecting the overly mechanical approach that Kuntz (2015: 31) has termed the “logics of extraction”. This review draws from an extremely broad area of research in the work we have been reading comes from very diverse disciplines. It is as important for us to recognise the shaping effects of these locations and endeavour to display some empathy for the different standpoints the authors come from. We try to remember their disciplinary context as we read and do our best to avoid doing violence to the authors’ work. “We must devise new ethical engagements if we are to live differently” (Kuntz, 2015: 30).

3.1 Search procedure

To search for relevant studies, an electronic and manual search was conducted. The most widely used electronic databases were screened: Academic Search Complete, Communication and Mass Media Complete, Humanities Full Text, JSTOR, Project Muse,

ProQuest – Social Sciences Journal and Web of Science. The keywords used in our search of relevant research literature (Figure 1) included digital literacy OR media engagement OR media play AND young children OR early childhood AND parenting OR home OR informal learning. To ensure that our review was as successful as possible, we ran an additional search with each of these terms separately. The combinations of those keywords were used to search for both titles and abstracts.

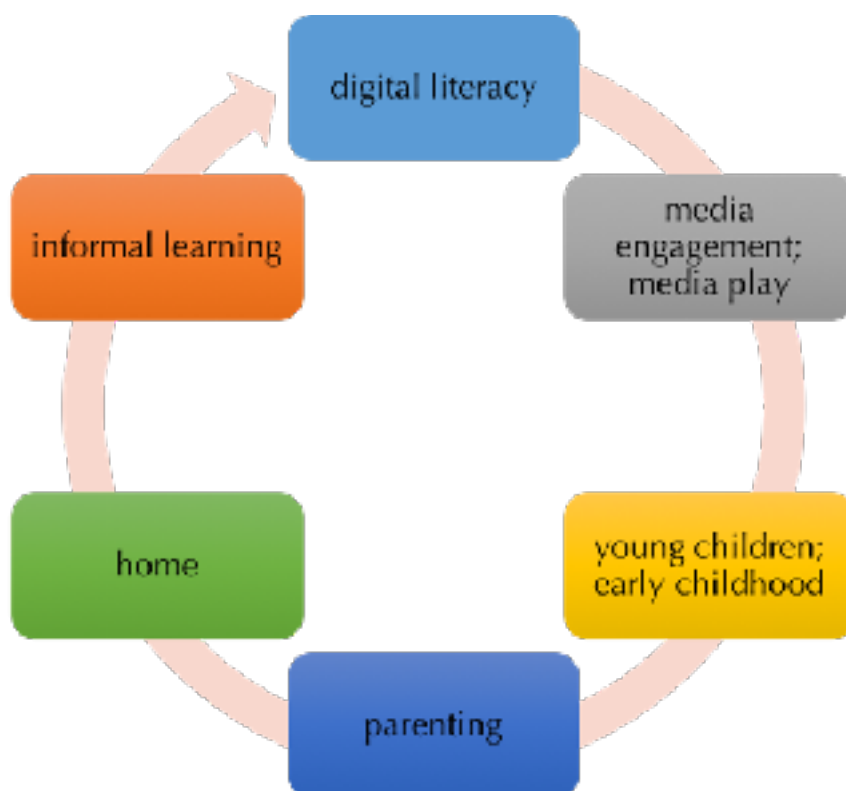


Figure 1. Key words of the literature search

When conducting the literature review we were also confronted with a very particular question related to the range of the search. The year limits would clearly be related to when digital devices were available in the home and communities of young children,

otherwise no digital literacy could take place. The distinction between a “with” or “without” digital media could nevertheless pose an unnecessary exclusion of studies that are very relevant. Television is a good example. Often we would not know if the studies conducted around television viewing was happening on a digital television or not, and the relevance of these studies cannot be judged on this basis criteria. Many of the reviewed studies show that television is a very important part of the media ecology that makes up children’s home environments, and we have therefore included studies on television without knowing if these were definitely digital or analog. We chose a pragmatic solution to the problem of time and media limits which meant that we included studies from after 2005, and all media that could be digital.

Three researchers conducted the search and reviewed the full texts of the studies initially selected. Altogether 73 articles were identified for the review from the years 2005-2015 of which 33 were selected. The inclusion criteria of the articles for the review included that the study reported needed to be empirical and that it was published in an international peer-reviewed journal or as an official study report (in English) using any type of data sources (e.g., questionnaires, interviews, written reflections), and located in any geographical area. Book chapters and dissertations were excluded because they were often difficult to retrieve and hard to assess whether they have been subjected to the same rigorous peer review process as journal articles. Final decisions about whether to include a study were based on reading the full manuscript. Any discrepancies were resolved through consensus. Nevertheless, given the breadth of locations for relevant studies we doubt this search is comprehensive. The authors welcome further suggestions for work that should have been included to feed into future publications in this area.

A list of the final articles included appears as Appendix A.

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Results

Informed by a descriptive and narrative approach, the review revealed three leading themes that emerged from the analysis, namely; Parental mediation of children's digital literacy practices in homes, Children's media engagement and literacy learning in homes, and home-school knowledge exchange of children's digital literacy practices. Next, the major findings of these themes will be highlighted. The key findings are summarised at the beginning of each theme followed by highlights from research.

4.1 Parental mediation of children's digital literacy practices in homes.

KEY FINDINGS

PARENTAL MEDIATION OF CHILDREN'S DIGITAL LITERACY PRACTICES IN HOMES

- **Many parents see digital technologies and media as positive but challenging at the same time.**
- **Parents are not always aware of the range of children's online activities and their skills.**
- **Perceiving benefits of children's digital activities is less straightforward for parents than anticipating risks.**
- **Parental mediation includes "co-use", "active mediation", "restrictive mediation", "supervision", "technical safety" and "guidance".**
- **Parental mediation is linked with the number and nature of media devices in the home, and the parents' gender, education, cultural/socioeconomic background, computer/internet skills and attitudes.**

A number of studies in our review were found to focus on parental mediation of children's digital literacy practices in homes. Altogether, about one half of the articles reviewed

focused on this theme. We should note that we are using “parents” as a shorthand for children’s principal carers, whoever these may be. This theme also intersected in some studies with a focus on children’s media engagement and literacy learning.

4.11 Many parents see digital technologies and media as positive but challenging at the same time.

Existing research on parental mediation reveals that many parents simultaneously see digital technologies and media as positive yet challenging. Adults perceive digital technologies as a vital part of their own worlds, essential for their children’s future and useful in the moment to engage them; however they are also concerned about overuse and perceive a need for regulation and concern (Chaudron, 2015). This pan-European study revealed moreover, that parents were found to perceive risks for their children under the age of eight in different dimensions, including unwelcome economic consequences, incidental inappropriate content, and adverse impacts on health or social impacts. Many parents have a tendency to postpone their concerns about risks to an ill-defined future stage (Chaudron, 2015).

The data appertaining to young children reported by (Livingstone, 2007) was collected 10 years before, but nonetheless valuable in situating parents’ concerns about their children’s uses of digital technologies among the full gamut of their activities and concerns in general. Regulating bedtime emerged as the most regular cause of arguments with their young children but television equalled housework as the second most frequent cause. Despite the newness of media as they successively arrive in the home, there are considerable consistencies over time in the responses of families, it being the slow-to-change relations between parents and children that shape patterns of domestic regulation and use. (Livingstone, 2007).

Radesky, Schmacher, and Zuckerman, (2015: 2) caution, “The instant accessibility and portability of mobile devices make them potentially more likely to displace human interactions and other enriching activities.” They suggest that marketing many apps as

educational, without any basis for the claim, may lead parents to allow technology use to displace interactions with caregivers, to the detriment of the child's wellbeing and language development.

The somewhat confusing mix of attitudes and experiences in families arguably creates a situation that can be exploited by commercial concerns with an at best thinly concealed profit motive. (Buckingham and Scanlon, 2005) identify the growth of "edutainment" as an essentially marketing based initiative of commercial products that claim to support children's learning at the same time as the child enjoys the activity. However such claims are not necessarily grounded in any evidence.

Thus some researchers perceive a need to provide more high quality apps for young children and their families. "There is value for both parents and children in media content that serves as a springboard for conversation and activities, as well as content that promotes joint media engagement. Such content is sorely needed across all platforms." (Lee and Barron, 2015: 5)

4.1.2 Parents are not always aware of the range of children's online activities and their skills.

The extensive studies reported by Chaudron, (2015); (see also Livingstone et al., 2015) include many examples of instances of parents not being aware of their children's activities and skills. Sometimes an interviewed parent demonstrates a relaxed attitude to this, not choosing to monitor their children; on many other occasions parents were relatively, although falsely, confident they understood their children's online activities and skills. Evidence presented shows that the contexts in which these occur are varied and complex. For example an atmosphere of trust, competence and safety might be occasionally checked by parental monitoring perhaps invisible to the child; discussions might be virtually constant; or parental restrictions might be flouted or even not set at all, even with a four-year old child.

It is not just in the context of online activities that parents may not understand, consciously at least, the range of children's media use. Tomopoulos et al., (2014) found that many children under two are exposed to television content that is not age appropriate.

4.1.3 Perceiving benefits of children's digital activities is less straightforward for parents than anticipating risks.

Parents believe that engagement with digital technologies can lead to benefits for their children but some have "vague views or few ideas" as to what kind of engagement they can facilitate (Chaudron, 2015: 15). Some parents however have clearer ideas and may refer to a wide range of benefits from fine motor skills to preparedness for future employment (Chaudron, 2015). Lee and Barron (2015) found that bilingual and Spanish-only families in the USA reported that their children learned English from educational media.

Parents are particularly concerned that inappropriate use of digital technologies could lead to dangers such as accidentally overspending, encountering inappropriate content (violence or bad language) or that too much use could damage their health or ability to socialise. However, they are less likely to perceive risks of encountering sexual content or unwanted contact with others online (Chaudron, 2015).

4.1.4 Parental mediation includes "co-use", "active mediation", "restrictive mediation", "supervision", "technical safety" and "guidance".

Existing research illuminates various mediation strategies parents use with their children in relation to the use of digital technologies and media in homes. Most parents use restrictive practices; some tie in access the digital devices children desire to a reward and punishment system; this has the effect of increasing the desirability of the devices (Chaudron, 2015). Restrictive mediation is frequently time based.

In their study, Nikken, and Jansz.(2014) investigated how Dutch parents guide the online activities of toddlers and young children. The results showed that parents used the same mediation strategies for the internet that they also applied for television and video games. These included 'co-use', 'active mediation', and 'restrictive mediation'. In addition, the parents were also found to utilise supervision and technical safety guidance strategies. Mediation was mainly predicted by the child's age and online behaviour (e.g., gaming, social networking), as well as by the number of computers in the home and the parents' gender, education and computer/internet skills.

The study by Chaudron (2015) identified parents using restrictive strategies, pointing out that parents have little knowledge of the actual digital activities of their children. The study also suggests that older siblings can be pro-active in risks-prevention of their younger brothers or sisters. In addition, the study points out that some children would welcome new ideas or further guidance about how to use the devices and apps available to them. Parents would welcome advice on fostering children's online safety.

The Slovenian four-year-old children reported on by Lepičnik-Vodopivec and Samec, (2013) had free access to digital technologies where they were perceived by the family as toys, but more restrictions on other types of devices, with girls facing more restrictions than boys; yet the same study found that more varied types of ICTs were present in the households with girls than boys only.

The presence and degree of parental rules restricting access to technologies depends partly on the technology itself as well as children's age. Goh, Bay, and Hsueh-Hua Chen, (2015) surveyed a relatively homogeneous group: 116 children aged 7 and 8 in Singapore. All students except one reported having to ask for parental permission before using a pc in the home, whereas a far smaller majority had to ask for permission to use a mobile phone, even if this was their parent's. Only just over half the children had access to a tablet and most of these always had to ask permission. Rules had to do with homework, rest and possible eye strain.

The quality of television viewing is important, in terms of whether the child is left unattended with a television running or co-viewing takes place: “at this early age, the context that parents create for television usage appears to be the major determinant of the child’s receptive vocabulary” (Bittman, Rutherford, Brown, and Unsworth, 2011: 167); factors such as total time spent in front of the TV did not lead to clear comparative findings.

In their study, Vandewater, Rideout, Wartella, Huang, Lee, and Shim (2007) focused on media access and use among US children aged 0 to 6, to assess how many young children fall within the then-current American Academy of Pediatrics (AAP) media-use guidelines, to identify demographic and family factors predicting adherence, and to assess the relation of guideline adherence to reading and playing outdoors (American Academy of Pediatrics. Committee on Public Education, 2001). The results indicate that children have widespread access to media, also in their own rooms. Parents do not adhere to AAP guidelines about television in child's bedroom. The study also reported that parents do not talk to pediatricians about media guidelines. Children who lived in single-parent families were more than twice as likely to fall outside of AAP media guidelines, than children in a two parent families. Ethnicity, income and education were not found to be related to whether children and their families followed AAP guidelines. Being in a media rich environment and not having rules about time was likely to make children fall outside the AAP guidelines. Interestingly, the study did not find a relation between children’s time spent on television viewing and time spend reading or on outdoor play.

Even with very young children, where the parent initially takes the role of tutor, this support fades as children quickly become competent in at least their favourite activities. The nature of the family affects who carries out the mediation; Chaudron, (2015) reports apparent national differences in the roles of parents siblings and grandparents for example in mediation.

4.1.5 Parental mediation is linked with the number and nature of media devices in the home, and the parents' gender, education, cultural/socioeconomic background, computer/internet skills and attitudes.

Existing research strongly suggests that parental mediation is related to a mix of cultural and contextual features. In Europe, high income, high educated parents display a wide range of diverse mediation strategies including with regard to setting restrictions (Livingstone et al., 2015). This study focused on the ways in which parents of young children manage digital devices at home and the role of parent income, education and parenting style. The results of this study show it can be less educated parents who are more likely to conceive of a generation gap between themselves and their children in terms of digital skills, and perhaps lack confidence themselves. More educated parents tended to be more confident of their digital skills and of their ability to effectively prioritise active mediation within their mix of strategies. Across all the family types, when parents had particular expertise in digital media, because of work or interests, they were found to be more confident of managing their children's digital media activities and more engaged in them.

It is important to explain the extent of media devices in the home does not correlate straightforwardly with higher income, despite the cost of such technologies. In Livingstone et al.'s (2015) analysis of data from 70 families across 7 countries, the lower income, less educated families tended to have a relatively high device ownership at home. Higher educated parents with relatively low income were mixed between media-rich and media-poor homes in terms of device ownership. Liebeskind, Piotrowski, Lapierre, and Linebarger, (2014: 501) expected to find "that families with a large number of media would likely have children who engage in greater media use and thus have more frequent opportunities for educational content exposure that would then boost language production." However their research, using parents' self-reports, did not bear out this hypothesis.

On the basis of a large-scale survey in the USA (Lauricella, Wartella and Rideout, 2015) found that "the interaction between parent attitudes and child age significantly predicted

child use of TV, computer, and tablets” (Lauricella, Wartella, and Rideout, 2015: 16). Kucirkova, Messer, Sheehy, and Flewitt, (2013) propose that the physical qualities of digital technologies make them more or less likely to lend themselves to opportunities for beneficial dyadic interactions between an adult carer and child: tablets and portable e-readers can lend themselves to co-reading with mutual pleasure and enjoyment reinforced by physical connections between the parties.

In their study, Vandewater, Park, Huang, and Wartella (2005), who looked into parental rules and young children’s media use, conclude that parents with higher socioeconomic status were more likely to have rules. The content of media mattered the most compared to time rules. Parents with positive attitudes towards television did more co-viewing with the children and that coincided with program rules. Parents with time rules were less likely to co-watch.

Another study by Nikken and Schols (2015) looking into how and why parents guide the media use of young children shows that children’s media skills and media activities had a strong relationships with parental mediation styles. Age was not found to influence parental mediation as parents were identified to adjust their scaffolding activities to their children’s development, media capacities and media activities. The study also identified socioeconomic differences in parents’ mediation strategies. Higher-income parents more often used newest forms of technologies to structure children’s media environment. Parents in low-income families were suggested to often lack skills and experienced difficulty in scaffolding their children’s media use.

In the study by Nikken and de Haan (2015) attention was directed to problems that parents experience in their parental mediation and the need for parenting support with regards to children’s internet use at home. The results revealed that the problems parents experienced were associated with negative views on media effects, the presence of older siblings living at home and these occurred especially when their child is active on social media. Parents’ feelings of competence were enhanced by positive views on media effects, older children being present in the home, and the involvement of the young child in educational use of technologies.

Also Takeuchi and Stevens, (2011) conclude from their study that cultural factors (friends and family), institutional factors (daycare and work) and parents' histories together shape co-use and childrearing practices around media. Whereas parents prefer co-use of older media they often see digital media as different (use of computers better than phones). Interestingly the study also points out that parents do not often think their own children are at risk, but that digital media present a risk to children in general.

4.2 Children's media engagement and literacy learning.

KEY FINDINGS

CHILDREN'S MEDIA ENGAGEMENT AND LITERACY LEARNING

- **Children in Europe grow up in media-rich homes.**
- **Digital technologies and media are an important (but not dominant) part of children's lives.**
- **Children typically demonstrate agency over technology: digital activities interact and support children's "offline" life interests as children use digital media as an enlargement of their activities.**
- **Children's literacy learning with and from digital technologies and media is mediated by the social context. Children learn from parental and peer mediation as well as from observation and imitation; parents seem sometimes not to be aware of their children's mirroring their behaviour.**

The review of literature revealed that slightly less than half of the reviewed studies focused more directly on issues dealing with children's media engagement and literacy learning.

4.2.1 Children in Europe grow up in media-rich homes.

Children grow up in media-rich homes, and are “daily in contact with a wide range of digital tools” (Chaudron, 2015). Nevertheless, that report, which explored 70 families in 6 European countries and Russia, found that this high level of presence does not necessarily mean that all these devices are available to young children. This finding is mirrored by research in the USA (Lauricella, Wartella and Rideout., 2015). In the UK it was suggested that by 2005 “Young children are ... growing up in a digital world” (Marsh et al., 2005).

Issues of access and equity are sometimes considered as inflected to such assertions. Lee and Barron, (2015) extrapolate from a national survey in the USA by language and suggest that Spanish-only speaking households have least access to digital technologies in comparison with other delineated groups. Aubrey and Dahl, (2014) mention findings from studies of assistive technology and children with disabilities.

4.2.2 Digital technologies and media are an important (but not dominant) part of children's lives.

Children’s uses of digital technologies are chiefly perceived as integrated with other aspects of everyday social life (Chaudron, 2015; Marsh et al., 2005). A representative survey of parents in the US found that the degree to which digital media are used by children has a robust correlation with their parents’ use (Lauricella, Wartella and Rideout, 2015). Particularly important to young children in contemporary times are tablets as they are easy to use, and smartphones, which are highly valued whether or not they are personally owned by children (Chaudron, 2015). Parents and children value activities that the family carry out together. (Chaudron, 2015). Reanalysis of the data in this report showed that higher income/higher educated parents in Europe are particularly likely to promote offline activities for children, while limiting time spent with digital devices (Livingstone et al., 2015).

The importance of parent-child interaction is an argument towards future actions to strengthen the quality of media products aimed at young children in the context of family life. Thus some researchers perceive a need to provide more high quality apps for young children and their families. "There is value for both parents and children in media content that serves as a springboard for conversation and activities, as well as content that promotes joint media engagement. Such content is sorely needed across all platforms." (Lee and Barron, 2015: 5)

Livingstone et al., (2015) propose that the media industries could take stronger roles in improving the quantity and quality of apps and sites that are beneficial to children's learning and wellbeing; communicating these and recommendations for finding and evaluating them and also to offer more information to parents in respect of tools that minimise risk of harm.

4.2.3 Children typically demonstrate agency over technology: digital activities interact and support children's "offline" life interests as children use digital media as an enlargement of their activities.

Research strongly suggests that although many children grow up today in media rich homes, children typically demonstrate agency over technology: digital activities interact and support children's "offline" life interests as children use digital media as an enlargement of their activities. The results of the study by Plowman, McPake, and Stephen (2010) of young children and technology in the home challenges technological determinism in suggesting that children are active rather than passive users of technology, that an increase in technological items in the home does not necessarily lead to an increase in use by children, and that a range of factors influence the ways in which technology is appropriated within a family setting and the kind of learning opportunities children's engagement with technologies can generate.

The review of research suggests that children's digital activities interact and support their "offline" life interests as children use digital media as an enlargement of their activities. For instance, a study by Davidson (2012) that focused on children's digital literacy practices in the home investigated the ways in which a young child obtained information, including how the child and adults informed each other of what they knew and did not know, during interactions that led to a Google search for the green basilisk lizard. The study found out that the use of digital technology was determined by the child rather than by the possibilities or affordances of the technology itself. Online content was brought into a physical context through use of the tool (computer) in order to be visible in that context, thus blurring the boundaries between online and offline activity in the process (see also Marsh, 2016).

The study by Chaudron (2015) focused on how children (0-8) in 70 families in six European countries (Belgium, Czech Republic, Finland, Germany, Italy, UK) and Russia engaged with digital technologies in homes, how parents mediated technology use, and on identifying potential benefits and risks associated with children's (online) interactions with new technologies. The study demonstrates that although children grow up in media-rich homes this rich-media context does not lead automatically to high use from the children. Hence, the authors conclude that although digital technologies are an important part of children's lives, it is not the most dominant part. In fact, the study suggests that digital activities support children's "offline" life interests and children use them as an enlargement of those activities. A great deal of children's play online is connected with offline interests, sometimes flowing fluidly across domains (Chaudron, 2015).

However detailed investigation reveals that typically young children do not understand what "online" means, what the internet is or what risks they might encounter or indeed benefits they may gain (Chaudron, 2015). This study found that many children would welcome guidance on making better use of the apps available to them. Digital technologies are relatively rarely used by children aged 6-7 for explicit educational purposes, unlike younger children (Chaudron, 2015: 18).

4.2.4 Children's literacy learning with and from digital technologies and media is mediated by the social context. Children learn from parental and peer mediation as well as from observation and imitation; parents seem sometimes not to be aware of their children's mirroring their behaviour.

The study by Chaudron (2015) points out that the social context matters for children's learning with and from digital technologies and media. Mostly, children learn from observation of close family members, with older siblings being important as well as parents (Chaudron, 2015). In some contexts extended family members such as grandparents can be important, as well as peers and even neighbours. Parents are often unaware of the extent to which children learn from their observations, for example it was during interviews reported by (Chaudron, 2015) that some parents learnt that their children knew their passwords. In the reanalysis of data from that report, (Livingstone et al., 2015) pointed out an apparent paradox that among the higher income/higher education group of parents, these include some media professionals whose own high use of digital technologies is then shared by their children at the same time as the parents are expressing positive evaluations of alternative, offline activities. Interestingly, parents were in most cases not aware of their children mirroring their behaviours.

Also the results of the study of Lauricella, Wartella, and Rideout (2015) indicate that parents' own screen time was strongly associated with child screen time. Other studies have identified how intergenerational transmission of reading and television taste occurs predominantly by direct imitation of parents' media behaviors (Notten, Kraaykamp, and Konig, 2012).

In their cohort study situated in Australia, Bittman, Rutherford, Brown, and Unsworth (2011) investigated the longitudinal effects that access to different media, context of their use and time spend with them have on children's (0-8) language development, vocabulary and traditional literacy. Various family-related factors such as parental mediation practices were also taken into account. The findings of the study point to the significance of the context and parents' role in negotiating media with the child. The study also underscores the importance of parental context in framing media use for acquiring vocabulary and

developing language skills. These findings are also supported by the study of Liebeskind, Piotrowski, Lapierre, and Linebarger. (2014) that explored how media and parent–child interactions are associated with children’s language production. The results indicated a positive association between literacy-based parent–child interactions and children’s language production. Similar findings are also drawn from the study of Heim, Brandtzieg, Hertzberg Kaare, Endestad, and Torgersen (2007) in a Norwegian context.

Carefully scaffolded use of appropriate apps on tablets can elicit complex behaviours that are similar to the previously well researched dyadic reading interactions, with perhaps extra elements made possible by the technology. Kucirkova, Messer, Sheehy, and Flewitt, (2013) used the app *Our Story* to enable a mother to pre-record a narrative and then play through the app with her 33-month-old daughter. The results of the study show that the app-mediated story-sharing context produced a harmonious and smooth interaction typical of ‘happy’ oral stories. “The child was physically manipulating the iPad, listening to the recorded mother’s voice while pointing with her finger to figures depicted in the picture and immediately responding to her mother’s question.” (Kucirkova, Messer, Sheehy, and Flewitt, 2013: 119). The study concludes that turning a shared memory into a unique, ‘lived’ story, composed of jointly contributed present and past multimodal story elements, elevating the story-sharing experience to a level of abstraction that is akin to experiencing and interpreting a piece of art. Wolfe and Flewitt, (2010), Danby et al., (2013) and Davidson, (2012) offer similarly powerful fine-grained studies of interactions.

The study of Plowman, Stevenson, Stephen, and McPake (2012) studying preschool children’s learning with technology at home identified four areas of learning that could be supported by technology: acquiring operational skills; extending knowledge and understanding of the world; developing dispositions to learn and understanding the role of technology in everyday life. The authors also point out that learning with technologies at home is the product of local circumstances (media coverage, childhood experiences, cultural norms).

In the study by Wong (2015) attention was given to the ways in which the home use of iPads engage children in multimodal literacy practices, motivates literacy learning and

provide opportunities for independent exploration and creation. The results of the study suggest that some children developed technoliteracy, and that traditional literacy skills can be developed in combination. The study also point to the need to foster connections between home and school literacy practices.

4.2.5 Using devices that are not configured for children’s use increases their risks of problematic experiences with pop ups sometimes with inappropriate content and in-app purchases

Young children often aspire to owning a smartphone, and while they do not, make use of their parents’. However, parents often do not realise what children are doing on their smartphones. They may, for example, introduce a child to a free app that appears safe in itself, but not realise the extent to which pop ups and adverts may lure the child towards problematic experiences (Chaudron, 2015).

4.3 Home-school knowledge exchange on children’s digital literacy practices

KEY FINDINGS

HOME-SCHOOL KNOWLEDGE EXCHANGE ON CHILDREN’S DIGITAL LITERACY PRACTICES

- **Children and parents believe that educators have little knowledge of children’s media engagement and digital literacy at home.**
- **Children report limited school work related to digital literacies.**
- **Parents would welcome stronger and more collaborative relationships with ECE/school settings, with information-sharing and exchange of good practice.**

A few studies in the data corpus of this review focused on issues dealing with home-school knowledge exchange on children's digital practices. Inevitably owing to its construction and scope, this element of our review is somewhat limited, focussing on home-school collaborations chiefly from the family perspective. Nevertheless we found key arguments consistently made. In this section we interlink the issues bullet-pointed above, reflecting this.

In the United Kingdom, Marsh et al. (2005) conducted a survey of 1852 parents of children aged from birth to 6 identifying young children's use of popular culture, media and new technologies. The study concluded that parents of young children felt their children developed a wide range of skills, knowledge and understanding in connection to use of digital technologies and media. Many parents felt that competences young children were developing in the media engagement were essential for the digital age and that early years settings and schools paid insufficient attention to new technologies.

In their study, focusing into practitioners, parents and young children's confidence and competence in ICT, Aubrey and Dahl (2014) found little evidence of practitioners' awareness of young children's home use of ICT or media-related lives, in general. As a consequence, they point out that the opportunity for home and school to work together to promote development of new technologies with young children is missed in many cases. Across Europe parents report knowing little about their children's digital activities in the nursery, kindergarten or at school (Livingstone et al., 2015). Parents would welcome stronger and more collaborative relationships with early years settings, with information-sharing and exchange of good practice regarding the use of technologies in the home to promote and enhance learning and development.

Many European parents see schools and other education or care institutions as potentially the most reliable sources of guidance for parents, yet they are not currently receiving this. Areas in which guidance was wanted, especially for less confident parents included:

- lists of recommended apps and sites
- criteria for good quality apps and sites
- advice on internet safety, including the management of passwords and

- privacy settings;
- support to increase their own skills, knowledge and capacity to support their children's beneficial interactions with technology.

(Livingstone et al., 2015)

Pre-school settings often have little knowledge of children's home practices and the digital technologies these young children met in educational settings are relatively limited in terms of opportunities and quality (Plowman, McPake, and Stephen, 2010). However the study by Marsh et al., (2005) which combined surveys of parents with surveys of early years practitioners in the UK found that overall the latter expressed positive attitudes towards digital technologies, while feeling they needed more professional development on its use. Interestingly a later study in England found very diverse views held by early years practitioners, some of whom perceived new technologies as damaging childhoods, while others felt it close to impossible to engage with the fast pace of change themselves (Wolfe and Flewitt, 2010).

Thus there is often a disconnect between children's in and out-of-school literacy practices and learning opportunities. For instance, Bussert-Webb and Diaz (2012) who studies Latino children's self-reports and researcher observations that their limited school work was related to digital literacies, whereas the technology children had access to in their homes focused on entertainment, communication with friends and video games. McPake, Plowman, and Stephen (2013) as, earlier, Marsh et al., (2005) argue for the importance of pre-school and early years specialists recognising and responding to the digital literacies and expertise children have developed in the home even before formal education. This is important given the increasing technologisation of communicative and creative activities in children's life worlds. Altogether, these arguments are worthy of attention as research shows that the introduction of popular culture, media and/or new technologies into the communications, language and literacy curriculum has a positive effect on children's motivation and engagement (Marsh et al., 2015) and potentially their learning (Plowman, Stevenson, Stephen, and McPake, 2012).

4

Key Messages From This Review

Key messages for parents

- Children are active and agentive in their use of digital technologies and media towards their own ends, moving fluidly between online and offline activities. In short, digital technologies are part of family life
- Parents should keep talking to their children about their activities with technologies, whatever their own levels of confidence and skills and attitudes towards restricting use
- Parents should be aware that their own actions are often mirrored by children.
- Parents should take care of the risks involved when children use devices not properly configured for their safe use.
- Other people such as siblings and extended family members can have a constructive role to play in children's media interactions.

Key messages for educational policy and practice

- Educational policy and practice have an important role in supporting every child's opportunities for safe, meaningful and transformative use of digital technologies and media that expands the repertoire of their activities and learning opportunities.
- There is a need to ensure that high quality apps are provided that enhance children's learning and wellbeing, in the home context and to ensure that parents are provided both with information about these and assisted to improve their own confidence in making judgements.

- There should be more mutual sharing of information and practice between homes and schools as to children's practices with digital technologies
- Parents perceive early years settings as appropriate sources for advice and guidance; so these should be appropriately resourced and encouraged to provide these, in the interests of children's learning and wellbeing.

Key messages for educational researchers

- A vast array of methods and research tools have been used in this field, as well as a variety of terminology. Researchers should consider carefully the opportunities and pitfalls of any particular methodology and ensure respectful, ethical interactions with all participants.
- There is considerable need for more research in this fast-changing field, especially that which could result in:
 - o better quality apps to enhance children's learning;
 - o effective ways of providing advice and guidance for parents, in terms of both opportunities for learning and enjoyment, as well as minimising risks;
 - o recommendations for fruitful liaison between families and early years settings.

Appendix 1

List of papers reviewed

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